

REMARKS

This Amendment is prepared in response to the non-final Office action (Unnumbered Paper) mailed on 16 May 2005.

Status Of Claims

Claims 1-24, 36-87 and 94-141 are pending. Claims 1 through 24, 36 through 41, 64 through 77, 94 through 101, 103 through 105, 107 through 111, 114, 115 and 124 have been allowed.

Claim 106 is amended in one instance to substitute –corresponding– for “correspond.”

Election/Restrictions

Applicant’s election with traverse of the filter species A (Figures 1a-c) and electrode species a (Figure 11A) in the reply filed on 10 March 2005 is acknowledged, yet the Examiner argues that the requirement is still deemed proper and is therefore made FINAL.

Claim Objections

Claim 106 is objected to because of an informality on line 10. The foregoing amendment removes the basis for this objection.

Claim Rejections under 35 USC §103(a)

Claims 42 through 63, 78 through 87, 102, 106, 112, 113, 116 through 123 and 125 through 141 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Examiner’s proposed combination of Carr ‘964 modified in view of Joannou ‘754. Applicant respectfully traverses this

rejection for the following reasons.

A. The Examining Staff's Proposed Combination Would Violate 35 U.S.C. §103(a) By Impermissibly Preventing The Primary Reference From Operating In Its Intended Mode Of Operation.

In support of the rejection, the Examiner asserts that in Figures 1 through 5 and in column 3 beginning with line 27 extending through column 4, line 41, Carr '964:

"discloses an electrically enhanced filter apparatus and process with a porous replaceable filter medium 30 positioned between perforated grids 26, 28 forming pockets between arms of the filter assembly substantially as claimed. It would appear that Carr may not expressly state that the grids are conducting. Furthermore, Carr may not explicitly disclose the presence of conductive print or insulated spacers."¹

In actuality, Carr '964 states that his air cleaning apparatus includes,

"a charged grids 26 spaced from the grounding grid 28. Grids 26 and 28 sandwich therebetween a sheet of foraminous filter media 30. The grids respectively comprise a plurality of V-shaped plate 29 having square-shaped openings of perforations 31 ... provided to permit air to flow from the inlet to the outlet of the apparatus. The ultimately charged and grounded grids develop electrostatic fields whereby the foreign particles entrained in the air stream are collected after foraminous filter media."²

The Examiner continued however by stating that Joannou '754 in Figures 1 through 6,

"teaches the well-known use of conductive grids 5, 10, including conductive graphite printing (note col. 4, lines 5-17), positioned on both sides of a filter medium 1 with an insulated spacer 12 (note col. 4, lines 53-65) to properly position the grids in an electrically enhanced filter apparatus and process for the purpose of ensuring maximum electric charging and particle collection (note Abstract and

¹ Unnumbered Paper dated 16 May 2005.

² Carr '964, column 3, lines 27-37.

col. 2, lines 20-64).”³

In actuality however, Joannou ‘754 teaches a structure in which:

“The upstream edges 9 of a fibrous pleated filter medium 1 have been made conductive by painting the folded edges 9, along with the protruding ends 3a of the fibers 2a which are within in protruding from the filter medium 1, with a conductive paint, allowing the ends 3a of the filter medium 5a to remain exposed. Again, such filter ends 3a are a source of iron 7. The conductive paint may be a solution of carbon or equivalent that leaves the carbon etc. as a conductive deposit 16.”⁴

Then, in support of the rejection, the Examining staff concludes that,

“it would have been readily obvious to one of ordinary skill in the art to employ conductive grids, conductive graphite printing, and insulator spacers in the Carr electrically enhanced filter device and method in order to increase electric charging and particle capture as taught by Joannou.”⁵

The Examining staff fails however, to provide any evidence in the record supporting this modification of the primary reference because the excerpted justification given by the Examining staff does not correspond with the express teachings of Joannou ‘754. Specifically, the Examiner’s proposed combination including Joannou ‘754 states that its structure will “increase trapping efficiency”⁶ and that,

“by applying high voltage to these strings, the fiber ends in the strings emit irons which charge the dust particles entering the filter, thus

³ Unnumbered Paper dated 16 May 2005.

⁴ Joannou ‘754, column 4, lines 5-13.

⁵ Unnumbered Paper dated 16th of May 2005.

⁶ Joannou ‘754, column 2, line 41.

improving the efficiency of the filter.”⁷

Nowhere does Joannou ‘754 advocate “maximum electric charging”, and in fact denigrates the creation of “a corona ... [which] produce a significant amount of ozone.”⁸

Moreover, and as earlier demonstrated in the foregoing remarks, the reliance by the Examining staff upon this feature of Joannou ‘754 contradicts the express teaching of Carr ‘964 that:

“In order to insure efficient operation of the air cleaning apparatus, it is important that the spacing between the charged and grounded grids respectively 26, 28 **be maintained uniform** so that the electrostatic fields generated therebetween **are of equal magnitude**. Openings 49 in members 40 and 41, in combination with tabs 48 extending from the ends of plates 29, insure that the plates are equally spaced along the support members. As noted before, the charged grid will preferably have a similar construction.”⁹

Joannou ‘754 however, teaches “conductive strings having conductive fiber ends attached to the filter medium along the folded edges of the pleats of the filter ... thus improving the efficiency of the filter.”¹⁰ Joannou ‘754 further teaches that “the downstream, folded edges of the pleated filter may be similarly coated to provide the ion-inducing conductive array.”¹¹ The Examiner’s proposed modification of the primary reference deprives the primary reference of the uniformity of “spacing between the charged and grounded grids respectively 26, 28” and the concomitant maintenance of “the electrostatic fields generated therebetween ... **of equal magnitude**” required by the primary

⁷ Joannou ‘754, column 2, lines 45-48.

⁸ Joannou ‘754, column 1, lines 18-26.

⁹ Carr ‘964, column 4, lines 15-24.

¹⁰ Joannou ‘754, column 2, lines 42-48.

¹¹ Joannou ‘754, column 2, lines 56-58.

reference,¹² by replacing in the proposed combination its structure and its concomitant assurance of the rigid maintenance of uniform spacing between the grids, and substitutes therefore a structure that is the antitheses of the express teachings of the primary reference;¹³ this modification impermissibly prevents the primary reference from relying upon the relation between openings 49 within members 40, 41 “**in combination with tabs 48**” to “insure that the plates **are equally spaced along the support members**” and thus, that “the electrostatic fields generated therebetween **are of equal magnitude.**”¹⁴ Consequently, the Examiner’s proposed combination impermissibly prevents the primary reference from operating in its intended mode. This fact alone is convincing and persuasive indicia of the non-obviousness of the pending claims. This rejection may not therefore, be maintained. Moreover, the proposed combination may not serve under 35 U.S.C. §103(a) as a basis for the rejection of claims 42 through 63, 78 through 87, 102, 106, 112, 113, 116 through 123 and 125 through 141. Its withdrawal is respectfully urged.

B. The Examining Staff Has Failed To Consider The Subject Matter Sought To Be Patented In Its Entirety As Required Under 35 U.S.C. §103(a).

This rejection is improperly premised upon the conclusion by the Examining staff that,

“it would have been readily obvious to one of ordinary skill in the art to employ conductive grids, conductive graphite printing, and

¹² Carr ‘964, column 4, lines 15-24.

¹³ How, by way of example, in the proposed combination of the Examining staff is the requisite uniformity of spacing of the primary reference to be maintained by “conductive strings having conductive fiber ends attached to the filter medium along the folded edges of the pleats of the filter” along both the ““the downstream, folded edges of the pleated filter” taught by the proposed combination Joannou ‘754?.

¹⁴ Carr ‘964, column 4, lines 18-19.

insulator spacers in the Carr electrically enhanced filter device and method in order to increase electric charging and particle capture as taught by Joannou.”¹⁵

According to MPEP 706.02(j), in order to establish a *prima facie* case of obviousness under 35 U.S.C. §103, the Examining staff must observe that:

“To establish a *prima facie* case of obviousness, three basic criteria must be met. **First**, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. **Second**, there must be a reasonable expectation of success. **Finally**, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).”

These criteria have not been meet by the Examining staff’s proposed combination with conductive grids, conductive graphite printing, and insulator spacers in the Carr electrically enhanced filter device and method in order to increase electric charging and particle capture as taught by Joannou.”¹⁶

Specifically claim 42 contemplates:

“a layer of a porous filter medium folded into one or more arms forming a pocket with a terminus of said pocket located on a downstream side of said medium and with a base of said pocket open to an upstream side of said apparatus;
a first electrically conducting, perforated grid disposed on an exterior of said medium to cover said downstream side of each of said arms; and
a second electrically conducting, perforated grid electrically separated from said first grid by at least said medium, disposed across the exterior of each of said arms on an upstream side of said medium”;

¹⁵ Unnumbered Paper dated 16th of May 2005.

¹⁶ Unnumbered Paper dated 16th of May 2005.

while claim 60 states:

“a layer of a porous filter medium disposed in a plurality of pleats within each of one or more of a plurality of arms, with said pleats undulating in succession, folded into said one or more arms forming a pocket with a terminus of said pocket located on a downstream side of said medium and with a base of said pocket open to an upstream side of said apparatus;
a first electrically conducting, perforated grid disposed to cover pleats along said downstream side of each of said arms; and
a second electrically conducting, perforated grid electrically separated from said first grid by said medium, disposed across pleats along a second exterior of each of said arms on an upstream side of said medium”;

process claim 78 states:

“arranging a layer of a filter medium, into at least two folds to define a terminus between each pair of said folds on a downstream side of said layer when said layer is positioned across a flow of a gaseous phase fluid, and an open base on an upstream side of said layer opposite from each corresponding apex;
disposing a first perforated, electrically conducting grid along exposed major surfaces of said downstream side of said layer; and
positioning a second perforated, electrically conducting grid along exposed major surfaces of said upstream side of said layer, spaced-apart and in electrical separation from said first grid by at least said medium”;

process claim 83 states:

“arranging into at least two transversely oblique folds, a layer of a filter medium exhibiting first major exterior surfaces on an upstream side of said layer separated by a thickness of said layer from second major exterior surfaces on a downstream side of said layer to accommodate passage of gaseous phase fluids through said medium while trapping particles borne by the fluids;
aligning a first electrically conducting grid with said folds along said first major exterior surfaces; and
aligning a second electrically conducting grid maintained in electrical separation by said filter medium from said first grid, with said folds along said second major exterior surfaces”;

claim 106 states:

“a layer of a porous medium having a major first surface and a major second surface, folded into one or more pairs of arms each joined together at a terminus and defining a pocket included between pairs of said arms;
a first electrically conducting grid extending across said arms of said first major surface;
a second electrically conducting grid extending across said arms of said second major surface; and
at least one of said first grid and said second grid comprising a print of an electrically conducting material deposited upon a corresponding one of said major first surface and said major second surface”;

claim 116 states:

“a layer of a porous filter medium folded into one or more arms to fit transversely across a passageway extending between upstream and downstream ports of the apparatus, with successive pairs of said arms alternately joined together to form a terminus and spaced-apart to form a pocket providing a base open to passage of effluent between the upstream and downstream ports;
a first grid of an electrically conducting material printed upon a first major exterior surface of said medium, across each of said arms of said first major exterior surface; and
a second, electrically conducting grid electrically separated from said first grid by said medium, disposed across each of said arms of a second major exterior surface of said medium”;

claims 125 states:

“a frame providing an inlet and an outlet;
a first electrically conducting porous grid attached to said frame to extend across said inlet, with said first grid folded into one or more arms forming a pocket with a terminus of said pocket positioned within said outlet and with a base of said pocket positioned to open toward said inlet; and
a replaceable media assembly removably insertably within said inlet, comprised of:
a layer of a porous filter material folded into a geometric construct providing a downstream surface conforming in contour to said porous grid, receivable within said pocket to cover said arms of said first grid; and
a second electrically conducting porous grid positioned in mating disposition with

an upstream surface of said filter material in conformance with said contour”;

and claim 131 states:

“a frame providing an inlet and an outlet;
a first electrically conducting porous grid attached to said frame to extend across said inlet, with said first grid folded into one or more arms forming a pocket with a terminus of said pocket positioned within said outlet and with a base of said pocket positioned to open toward said inlet;
a replaceable layer of a porous filter material folded into a geometric construct providing an upstream surface exposed through said inlet and a downstream surface conforming in contour to said porous grid, removably receivable within said pocket to cover said arms; and
a second electrically conducting porous grid removably insertable through said inlet and folded to conform to said contour of said upstream surface of said layer of filter material and cover said upstream surface of said filter material.”

the Examiner continues and concludes that:

“[c]onsequently, it would have been readily obvious to one of ordinary skill in the art to employ conductive grids, conductive graphite printing, and insulator spacers in the Carr electrically enhanced filter device and method in order to increase electric charging and particle capture as taught by Joannou.”¹⁷

What is missing here is evidence in the prosecution of a teaching or suggestion of that either (i) “upstream edges 9 of fibrous pleated filter medium 1”¹⁸ which serve in the Examining staff’s proposed combination as a source of ions could also simultaneously serve as a charged grid 26, or a grounded grid 28 in the primary reference, or that (ii) the “upstream edges 9 of a fibrous pleated filter medium 1 [that] have been made conductive by painting the folded edges 9, along with the protruding ends 3a of the fibers 2a ... allowing the ends 3a of the filter medium fibers 2a to remain

¹⁷ Unnumbered Paper dated 16 May 2005.

¹⁸ Joannou ‘754, column 4, lines 5 and 6.

exposed ... such [that] fiber ends 3a are a source of ions 7"¹⁹ may be substituted for ionizing wires 16 in ionizing section 12 of Carr '964 in an effort to provide the uniformity of "spacing between the charged and grounded grids respectively 26, 28" and the concomitant maintenance of "the electrostatic fields generated therebetween ... **of equal magnitude**" required by the primary reference.²⁰ This ignores "the subject matter as a whole"²¹ of the foregoing excerpts from the rejected claims because, among other deficiencies, the "upstream edges 9 of a fibrous pleated filter medium 1 [that] have been made conductive by painting the folded edges 9, along with the protruding ends 3a of the fibers 2a ... such [that] fiber ends 3a are a source of ions 7"²² fails to meet the respective grids defined in these claims. This deficiency may not be ignored because it is these features, among other, that advantageously advance the art by improving collection efficiency and well as improving operational maintenance of the system employing Applicant's filters, without the awkwardness of the combination proposed by the Examining staff. Accordingly, this combination fails to make a *prima facie* showing of obviousness, and must be withdrawn.

C. There Is No Basis 35 U.S.C. §103(a) For Making The Modification Of The Combination Proposed By The Examining Staff Except The Teachings Of Applicant.

In support of the rejection, the Examiner asserts that in Figures 1 through 5 and in column 3 beginning with line 27 extending through column 4, line 41, Carr '964:

¹⁹ Joannou '754, column 4, lines 5-11.

²⁰ Carr '964, column 4, lines 15-24.

²¹ 35 U.S.C. §103(a).

²² Joannou '754, column 4, lines 5-11.

“discloses an electrically enhanced filter apparatus and process with a porous replaceable filter medium 30 positioned between perforated grids 26, 28 forming pockets between arms of the filter assembly substantially as claimed. It would appear that Carr may not expressly state that the grids are conducting. Furthermore, Carr may not explicitly disclose the presence of conductive print or insulated spacers.”²³

This interpretation of the combination proposed by the Examining staff is unsupported by the evidence of record, because, in actuality, Carr ‘964 states that his air cleaning apparatus includes,

“a charged grid 26 spaced from the grounding grid 28. Grids 26 and 28 sandwich therebetween a sheet of foraminous filter media 30. The grids respectively comprise a plurality of V-shaped plate 29 having square-shaped openings of perforations 31 ... provided to permit air to flow from the inlet to the outlet of the apparatus. The ultimately charged and grounded grids develop electrostatic fields whereby the foreign particles entrained in the air stream are collected after foraminous filter media.”²⁴

The Examining staff continued however, by stating that the secondary reference, Joannou ‘754 in Figures 1 through 6,

“teaches the well-known use of conductive grids 5, 10, including conductive graphite printing (note col. 4, lines 5-17), positioned on both sides of a filter medium 1 with an insulated spacer 12 (note col. 4, lines 53-65) to properly position the grids in an electrically enhanced filter apparatus and process for the purpose of ensuring maximum electric charging and particle collection (note Abstract and col. 2, lines 20-64).”²⁵

Again, the interpretation of the combination proposed by the Examining staff differs from that found in the evidence of record because, in reality however, Joannou ‘754 teaches a structure in which:

²³ Unnumbered Paper dated 16 May 2005.

²⁴ Carr ‘964, column 3, lines 27-37.

²⁵ Unnumbered Paper dated 16 May 2005.

“[t]he upstream edges 9 of a fibrous pleated filter medium 1 have been made conductive by painting the folded edges 9, along with the protruding ends 3a of the fibers 2a which are within in protruding from the filter medium 1, with a conductive paint, allowing the ends 3a of the filter medium 5a to remain exposed. Again, such filter ends 3a are a source of iron 7. The conductive paint may be a solution of carbon or equivalent that leaves the carbon etc. as a conductive deposit 16.”²⁶

Despite these diversions between the Examiner staff’s interpretation of the prior art and the express teachings of that art, the Examiner continues and concludes that:

“[c]onsequently, it would have been readily obvious to one of ordinary skill in the art to employ conductive grids, conductive graphite printing, and insulator spacers in the Carr electrically enhanced filter device and method in order to increase electric charging and particle capture as taught by Joannou.”²⁷

As noted earlier in these remarks, what is missing here is evidence in the prosecution of a teaching or suggestion that (i) “upstream edges 9 of fibrous pleated filter medium 1”²⁸ which serve in the Examining staff’s proposed combination as a source of ions could also simultaneously serve as a charged grid 26, or a grounded grid 28 in the primary reference, and that (ii) the “upstream edges 9 of a fibrous pleated filter medium 1 [that] have been made conductive by painting the folded edges 9, along with the protruding ends 3a of the fibers 2a which are within and protruding from the filter medium 1, with a conductive paint, allowing the ends 3a of the filter medium fibers 2a to remain exposed ... such [that] fiber ends 3a are a source of ions 7”²⁹ may be substituted for ionizing wires

²⁶ Joannou ‘754, column 4, lines 5-13.

²⁷ Unnumbered Paper dated 16 May 2005.

²⁸ Joannou ‘754, column 4, lines 5 and 6.

²⁹ Joannou ‘754, column 4, lines 5-11.

16 in ionizing section 12 of Carr ‘964. Even assuming *arguendo* a basis in the art for this modification, how is ionizing section 12 of Carr ‘964 to operate? Recognition must be given to the fact that in the proposed combination of the Examining staff, ionizing section 12 is necessarily physically and spatially separate from collection section 14, with “a collector section having alternately charged and grounded grids sandwiching therebetween a sheet of forminous filter media.”³⁰ The sole basis of record for construction of such a structure is the light provided by Applicant alone; this may not be used to justify a selective picking and choosing among the various components found in the art in an impermissible hindsight effort to reconstruct Applicant’s teachings. Given these deficiencies in the combination proposed by the Examining staff, the proposed combination may not serve under 35 U.S.C. §103(a) as a basis for the rejection of claims 42 through 63, 78 through 87, 102, 106, 112, 113, 116 through 123 and 125 through 141. Its withdrawal is respectfully urged.

Allowable Subject Matter

Claims 1 through 24, 36 through 41, 64 through 77, 94 through 101, 103 through 105, 107 through 111, 114, 115, and 124 are allowed.

Fees Incurred

A fee of \$225.00 is incurred by filing of a petition for a two month extension of time, set to expire on 16 October 2005. Applicant’s check drawn to the order of Commissioner accompanies this Amendment. Should the check become lost, be deficient in payment, or should other fees be

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Carr ‘964, column 1, line 68 to column 2, line 2.

incurred, the Commissioner is authorized to charge Deposit Account No. 02-4943 of Applicant's undersigned attorney in the amount of such fees.

Conclusion

In view of the above, it is submitted that all of the claims now present in the application are patentable over the cited references, taken either alone or combination and accordingly should now be in a conditions suitable for allowance.

Respectfully submitted,



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